

WHAT IS CLAIMED IS:

- 1 1. A patient controllable atrial shock therapy system
- 2 including an implantable atrial shock therapy device, comprising:
 - 3 (a) an atrial arrhythmia detector for detecting an atrial
 - 4 arrhythmia event episode and updating automatically an atrial arrhythmia
 - 5 event status periodically throughout the duration of a detected atrial
 - 6 arrhythmia event episode;
 - 7 (b) patient activation request detection means for
 - 8 detecting a patient activation request originating from external to the
 - 9 implantable device; and
 - 10 (c) message generator means for generating a message
 - 11 indicating the periodically updated arrhythmia event status in response to
 - 12 detection of the patient activation request.

1 2. The patient controllable atrial shock therapy system of
2 Claim 1 wherein the atrial arrhythmia detector includes means for
3 detecting atrial arrhythmia event episodes selected from the group of
4 atrial arrhythmias consisting of atrial tachycardia and atrial fibrillation.

1 3. The patient controllable atrial shock therapy system of
2 Claim 1 wherein the atrial arrhythmia detector includes means for
3 updating atrial arrhythmia event status periodically at each occurrence of
4 a selected cardiac event occurring throughout the duration of a detected
5 atrial arrhythmia event episode.

1 4. The patient controllable atrial shock therapy system of
2 Claim 3 wherein the atrial arrhythmia detector includes means for
3 updating atrial arrhythmia event status periodically at each occurrence of
4 a ventricular event occurring throughout the duration of a detected atrial
5 arrhythmia event episode.

1 5. The patient controllable atrial shock therapy system of
2 Claim 1 wherein the patient activation request detection means includes a
3 reed switch responsive to a magnetic field to operate the reed switch to
4 provide the patient activation request.

1 6. The patient controllable atrial shock therapy system of
2 Claim 5 wherein the message generator means generates messages
3 indicating the periodically updated arrhythmia event status as long as the
4 magnetic field operates the reed switch.
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1 7. The patient controllable atrial shock therapy system of
2 Claim 1 wherein the message generator includes means for generating
3 messages indicating the periodically updated arrhythmia event status as
4 long as the patient activation request is detected.

1 8. The patient controllable atrial shock therapy system of
2 Claim 1 wherein the message generator means includes means for
3 generating an audible tone indicating the periodically updated arrhythmia
4 event status.

1 9. The patient controllable atrial shock therapy system of
2 Claim 1 wherein the patient activation request detection means includes a
3 reed switch responsive to a magnetic field to operate the reed switch to
4 provide the patient activation request, wherein the message generator
5 means generates the message indicating the periodically updated
6 arrhythmia event status in response to operation of the reed switch, and
7 wherein the message generator means includes means for generating an
8 audible tone indicating the periodically updated arrhythmia event status,
9 and further comprising a hand-held activator including:

10 (a) a magnet for generating the magnetic field to operate
11 the reed switch when the activator is positioned near the implantable
12 device;
13 (b) tone detector means for receiving the audible tone
14 indicating the periodically updated arrhythmia event status and converting
15 the audible tone indicating the periodically updated arrhythmia event
16 status into an electrical signal indicating the periodically updated
17 arrhythmia event status; and
18 (c) display means responsive to the electrical signal
19 indicating the periodically updated arrhythmia event status for displaying
20 on the activator a visual indication of the periodically updated arrhythmia
21 event status.

1 10. The patient controllable atrial shock therapy system of
2 Claim 1 wherein the patient activation request detection means includes a
3 patient activation request receiver adapted to receive a patient activation
4 request signal, wherein the implantable cardiac device comprises
5 additionally a status message transmitter responsive to the message
6 generator means for transmitting a status message indicating the
7 periodically updated arrhythmia event status, and further comprising a
8 hand-held activator including:
9 (a) a patient activation request transmitter for
10 transmitting a patient activation request signal to be received by the
11 patient activation request receiver;
12 (b) a status message receiver adapted to receive the
13 status message indicating the periodically updated arrhythmia event
14 status from the status message transmitter; and
15 (c) display means responsive to the status message
16 received by the status message receiver for displaying on the activator a
17 visual indication of the periodically updated arrhythmia event status.

1 11. A patient controllable atrial shock therapy system
2 including an implantable atrial shock therapy device, comprising:
3 (a) an atrial arrhythmia detector for detecting an atrial
4 arrhythmia event episode and for providing an atrial arrhythmia event
5 status;
6 (b) an atrial cardioverter for providing atrial shock therapy;
7 (c) patient activation request detection means for
8 detecting a patient activation request originating from external to the
9 implantable device;
10 (d) message generator means for generating a message
11 indicating the atrial arrhythmia event status responsive to the detection of
12 the patient activation request; and
13 (e) shock therapy control means for requesting and
14 withholding the providing of atrial shock therapy in response to a duration
15 of the detected patient activation request.

1 12. The patient controllable atrial shock therapy system of
2 Claim 11 wherein the atrial arrhythmia detector includes additionally
3 means for automatically updating atrial arrhythmia event status
4 periodically throughout the duration of a detected atrial arrhythmia event
5 episode.

1 13. The patient controllable atrial shock therapy system of
2 Claim 12 wherein the atrial arrhythmia detector includes means for
3 updating atrial arrhythmia event status periodically at each occurrence of
4 a selected cardiac event occurring throughout the duration of a detected
5 atrial arrhythmia event episode.

1 14. The patient controllable atrial shock therapy system of
2 Claim 13 wherein the atrial arrhythmia detector includes means for
3 updating atrial arrhythmia event status periodically at each occurrence of

4 a ventricular event occurring throughout the duration of a detected atrial
5 arrhythmia event episode.

1 15. The patient controllable atrial shock therapy system of
2 Claim 11 wherein the atrial arrhythmia detector includes means for
3 detecting atrial arrhythmia event episodes selected from the group of
4 atrial arrhythmias consisting of atrial tachycardia and atrial fibrillation and
5 wherein the atrial cardioverter includes means for providing atrial shock
6 therapy selected from the group of atrial shock therapies consisting of
7 atrial antitachycardia pacing and atrial defibrillation shock therapy.

1 16. The patient controllable atrial shock therapy system of
2 Claim 11 wherein the patient activation request detection means includes
3 a reed switch responsive to a magnetic field to operate the reed switch
4 to provide the patient activation request, and wherein the shock therapy
5 control means requests shock therapy in response to operation of the reed
6 switch by the magnetic field for greater than a selected duration and
7 withdraws shock therapy in response to operation of the reed switch by
8 the magnetic field for less than the selected duration.

1 17. The patient controllable atrial shock therapy system of
2 Claim 11 wherein the message generator means includes means for
3 generating an audible tone indicating the arrhythmia event status.

1 18. The patient controllable atrial shock therapy system of
2 Claim 11 wherein the patient activation request detection means includes
3 a reed switch responsive to a magnetic field to operate the reed switch
4 to provide the patient activation request, wherein the shock therapy
5 control means requests and withdraws shock therapy in response to a
6 duration of operation of the reed switch by the magnetic field, and
7 wherein the message generator means includes means for generating an

8 audible tone indicating the arrhythmia event status, and further
9 comprising a hand-held activator including:

10 (a) a magnet for generating the magnetic field to operate
11 the reed switch when the activator is positioned near the implantable
12 device;

13 (b) tone detector means for receiving the audible tone
14 indicating the arrhythmia event status and converting the audible tone
15 indicating the arrhythmia event status into an electrical signal indicating
16 the arrhythmia event status; and

17 (c) display means responsive to the electrical signal
18 indicating the arrhythmia event status for displaying on the activator a
19 visual indication of the arrhythmia event status.

1 19. The patient controllable atrial shock therapy system of
2 Claim 11 wherein the message generator includes additionally means for
3 generating a message indicating an availability of atrial shock therapy
4 responsive to the patient activation request.

1 20. The patient controllable atrial shock therapy system of
2 Claim 19 wherein the message generator means includes means for
3 generating an audible tone indicating the arrhythmia event status and the
4 availability of atrial shock therapy.

1 21. The patient controllable atrial shock therapy system of
2 Claim 20 wherein the message generator means includes means for
3 generating a first audible tone indicating that an atrial arrhythmia event is
4 in progress and that atrial shock therapy is available and a second audible
5 tone distinguishable from the first audible tone indicating that an atrial
6 arrhythmia event is in progress but that atrial shock therapy is not
7 available.

1 22. A method for controlling an implantable atrial shock
2 therapy device, comprising the steps of:
3 (a) detecting an atrial arrhythmia event episode and
4 automatically updating an atrial arrhythmia event status periodically
5 throughout the duration of a detected atrial arrhythmia event episode with
6 the implantable device;
7 (b) providing a patient activation request to the
8 implantable device from external to the implantable device; and
9 (c) generating a message from the implantable device
10 indicating the periodically updated arrhythmia event status in response to
11 receipt of the patient activation request by the implantable device.

1 23. The method of Claim 22 wherein the step of
2 detecting an atrial arrhythmia event episode includes the step of detecting
3 atrial arrhythmia event episodes selected from the group of atrial
4 arrhythmias consisting of atrial tachycardia and atrial fibrillation.

1 24. The method of Claim 22 wherein the step of
2 automatically updating an atrial arrhythmia event status includes the step
3 of updating atrial arrhythmia event status periodically at each occurrence
4 of a selected cardiac event occurring throughout the duration of a
5 detected atrial arrhythmia event episode.

1 25. The method of Claim 24 wherein the step of
2 automatically updating an atrial arrhythmia event status includes the step
3 of updating atrial arrhythmia event status periodically at each occurrence
4 of a ventricular event occurring throughout the duration of a detected
5 atrial arrhythmia event episode.

1 26. The method of Claim 22 wherein the step of providing
2 a patient activation request to the implantable device from external to the

3 implantable device includes the step of positioning a magnet near the
4 implantable device.

1 27. The method of Claim 26 wherein the step of
2 generating a message from the implantable device indicating the
3 periodically updated arrhythmia event status is repeated periodically as
4 long as the magnet is positioned near the implantable device.

1 28. The method of Claim 22 wherein the step of
2 generating a message from the implantable device indicating the
3 periodically updated arrhythmia event status includes the step of
4 generating messages indicating the periodically updated arrhythmia event
5 status as long as the patient activation request is received by the
6 implantable device.

1 29. The method of Claim 22 wherein the step of
2 generating a message from the implantable device indicating the
3 periodically updated arrhythmia event status includes the step of
4 generating an audible tone indicating the periodically updated arrhythmia
5 event status.

1 30. The method of Claim 29 comprising additionally the
2 step of generating a visual indication of the periodically updated
3 arrhythmia event status from the audible tone indicating the periodically
4 updated arrhythmia event status.

1 31. The method of Claim 22 wherein the step of providing
2 a patient activation request to the implantable device from external to the
3 device includes the step of transmitting a patient activation request signal
4 to the implantable device and wherein the step of generating a message
5 from the implantable device indicating the periodically updated arrhythmia

6 event status includes the step of transmitting a message from the
7 implantable device indicating the periodically updated arrhythmia event
8 status.

1 32. The method of Claim 31 comprising additionally the
2 step of displaying a visual indication of the periodically updated
3 arrhythmia event status responsive to the message transmitted from the
4 implantable device indicating the periodically updated arrhythmia event
5 status.

1 33. A method of controlling an implantable atrial shock
2 therapy device, comprising the steps of:
3 (a) detecting an atrial arrhythmia event episode and
4 providing an atrial arrhythmia event status with the implantable device;
5 (b) detecting a patient activation request originating from
6 external to the implantable device;
7 (c) generating a message from the implantable device
8 indicating the arrhythmia event status responsive to the detection of the
9 patient activation request; and
10 (d) requesting and withholding providing of atrial shock
11 therapy by the implantable device in response to a duration of detection
12 of the detected patient activation request.

1 34. The method of Claim 33 comprising additionally the
2 step of automatically updating atrial arrhythmia event status periodically
3 throughout the duration of a detected atrial arrhythmia event episode with
4 the implantable device.

1 35. The method of Claim 34 wherein the step of
2 automatically updating atrial arrhythmia event status includes the step of
3 updating atrial arrhythmia event status periodically at each occurrence of

4 a selected cardiac event occurring throughout the duration of a detected
5 atrial arrhythmia event episode.

1 36. The method of Claim 35 wherein the step of
2 automatically updating atrial arrhythmia event status includes the step of
3 updating atrial arrhythmia event status periodically at each occurrence of
4 a ventricular event occurring throughout the duration of a detected atrial
5 arrhythmia event episode.

1 37. The method of Claim 33 wherein the step of detecting
2 an atrial arrhythmia event episode includes the step of detecting atrial
3 arrhythmia event episodes selected from the group of atrial arrhythmias
4 consisting of atrial tachycardia and atrial fibrillation.

1 38. The method of Claim 33 wherein the step of detecting
2 a patient activation request originating from external to the patient
3 includes the step of detecting a magnetic field positioned near the
4 implantable device and wherein the step of requesting and withholding
5 atrial shock therapy includes the step of requesting shock therapy in
6 response to detection of the magnetic field for greater than a selected
7 duration and withholding shock therapy in response to detection of the
8 magnetic field for less than a selected duration.

1 39. The method of Claim 33 wherein the step of
2 generating a message from the implantable device indicating the
3 arrhythmia event status includes the step of generating an audible tone
4 indicating the arrhythmia event status.

1 40. The method of Claim 39 comprising additionally the
2 step of generating a visual indication of the arrhythmia event status from
3 the audible tone indicating the arrhythmia event status.

1 41. The method of Claim 33 comprising additionally the
2 step of generating a message indicating an availability of atrial shock
3 therapy responsive to the detection of the patient activation request.

1 42. The method of Claim 41 wherein the step of
2 generating a message indicating an availability of atrial shock therapy
3 includes the step of generating an audible tone indicating the arrhythmia
4 event status and the availability of atrial shock therapy.

1 43. The method of Claim 42 wherein the step of
2 generating an audible tone indicating the arrhythmia event status and the
3 availability of atrial shock therapy includes the step of generating a first
4 audible tone indicating that an atrial arrhythmia event is in progress and
5 that atrial shock therapy is available and a second audible tone
6 distinguishable from the first audible tone indicating that an atrial
7 arrhythmia event is in progress but that atrial shock therapy is not
8 available.

1 44. A patient controllable cardiac shock therapy system
2 including an implantable cardiac shock therapy device, comprising:
3 (a) an arrhythmia detector for detecting a cardiac
4 arrhythmia and providing a cardiac arrhythmia event status;
5 (b) patient activation request detection means for
6 detecting a patient activation request originating from external to the
7 implantable device; and
8 (c) message generator means for generating audible tone
9 messages within the implantable device indicating the cardiac arrhythmia
10 event status in response to detection of the patient activation request.

1 45. A method for controlling an implantable cardiac shock
2 therapy device, comprising the steps of:

3 (a) detecting a cardiac arrhythmia and providing a cardiac
4 arrhythmia event status with the implantable device;
5 (b) providing a patient activation request to the
6 implantable device from external to the implantable device; and
7 (c) generating audible tone messages from the implantable
8 device indicating the cardiac arrhythmia event status in response to
9 receipt of the patient activation request by the implantable device.

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1 46. The method of Claim 45 comprising additionally the
2 step of generating a visual indication of the arrhythmia event status from
3 the audible tone messages indicating the arrhythmia event status.

4 47. A handheld activator device for controlling an
5 implantable shock therapy device, comprising:
6 (a) a magnet positioned in the activator device for
7 providing activation signals to the implantable shock therapy device;
8 (b) tone detector means within the activator device for
9 receiving audible tone status messages from the implantable shock
10 therapy device and converting the audible tone status messages into
11 electrical signal status messages; and
12 (c) display means responsive to the electrical signal status
13 messages for displaying on the activation device a visual representation of
14 the status messages.

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